Southface

Non-profit that promotes sustainable workplaces, homes and communities through education, research, advocacy and technical assistance.

- Visionary Dinner
  March 17, 2004
- Greenprints Conference
  March 18 – 19, 2004
- Sustainable Atlanta Roundtable
- Green Building Services
- EarthCraft House

U.S. Green Building Council

Site

Water

Energy

Materials

IEQ

Defining a Sustainable Building

LEED™: Leadership in Energy and Environmental Design

LEED™ Program

Five elements define sustainability

- Prerequisites - non-negotiable
- Core Credits - optional (total of 64 credits)
- Innovation & Design Credits - optional (5 bonus credits)

Levels of certification

Certified	26-32 points
Silver	33-38 points
Gold	39-51 points
Platinum	52-64 points

Why Was LEED Created?

Design and construction that significantly reduces the negative impact of buildings on the environment and occupants.

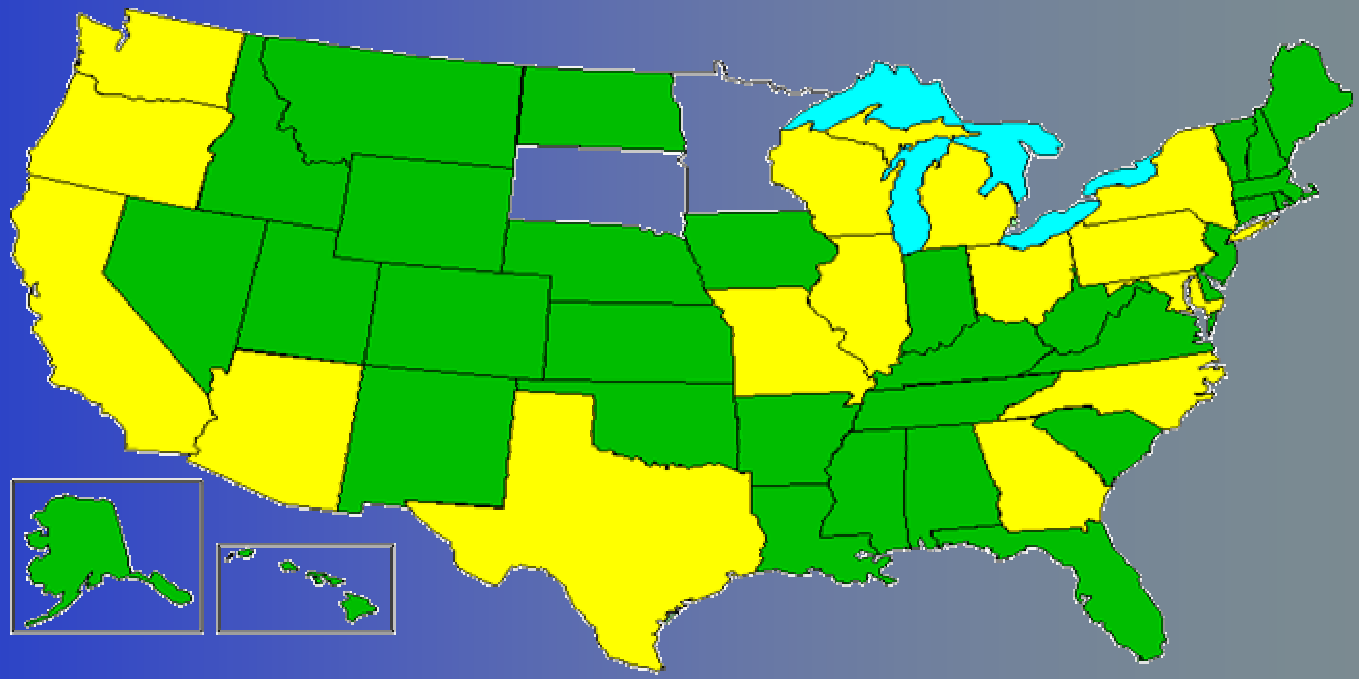
- Transform the marketplace
- Standard of measurement for green buildings
  prevent “greenwashing” (false, exaggerated claims)
- Integrate design processes
- Better utilize existing, proven technologies

Why Was LEED Created?

- Provide design guidelines
- Recognize leaders
- Stimulate green competition
- Establish market value with recognizable national “brand”
- Raise consumer awareness

LEED Market Transformation

- 38 Certified Projects*
- 601 Registered Projects*

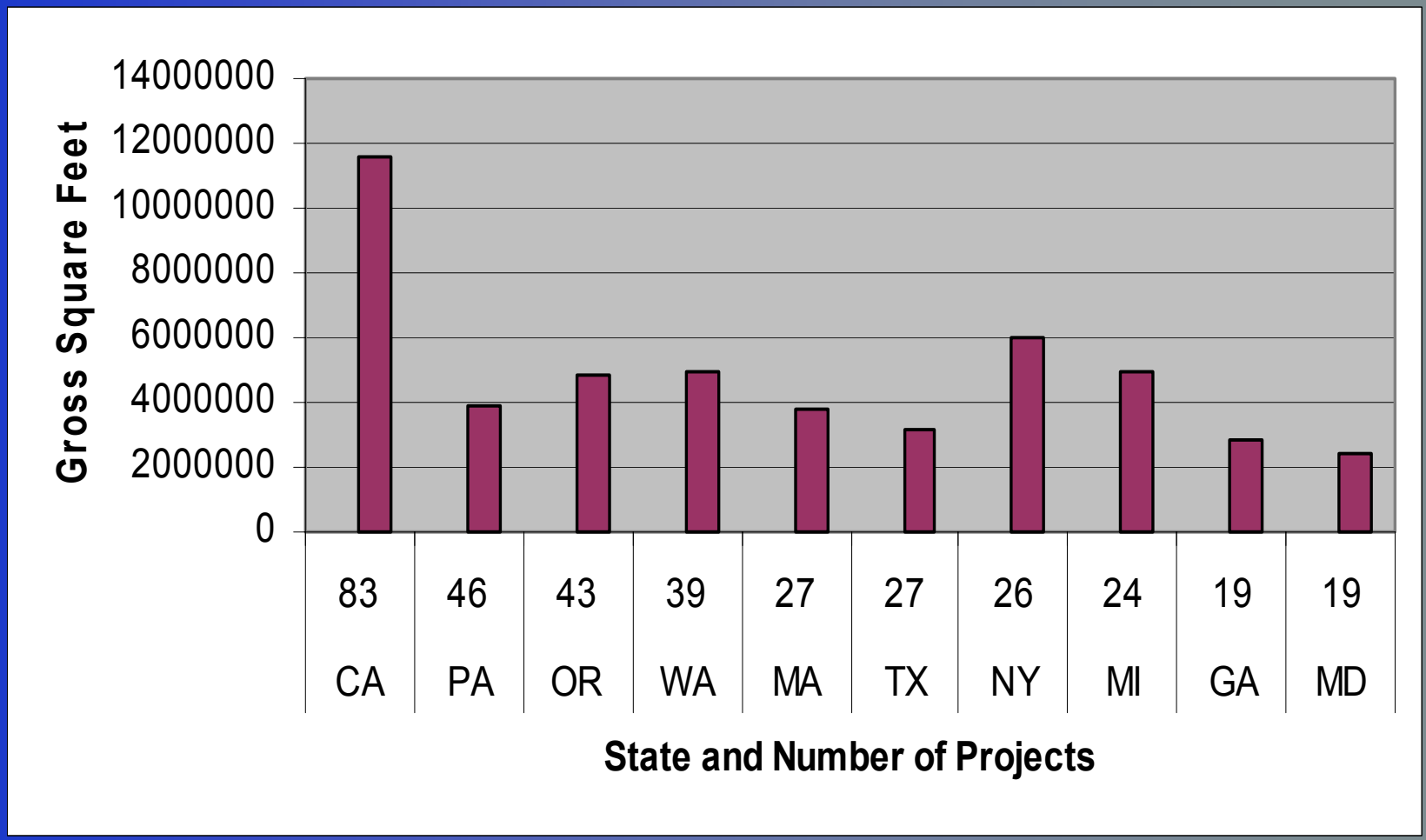


77 M gsf* 48 States 7 Countries*

*As of 12.16.02

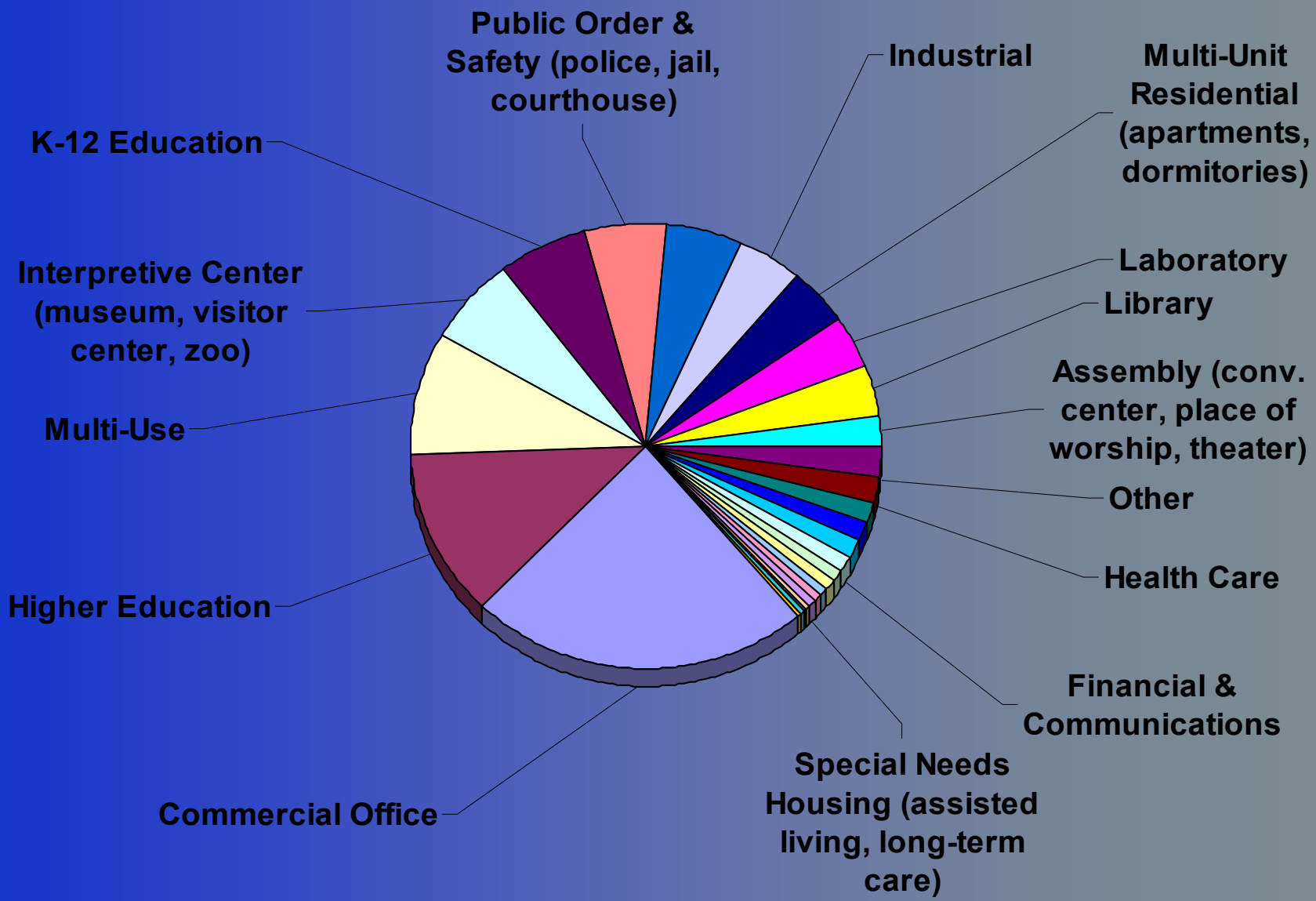
LEED™ Market Transformation

- Registered Projects by State* - Top 10



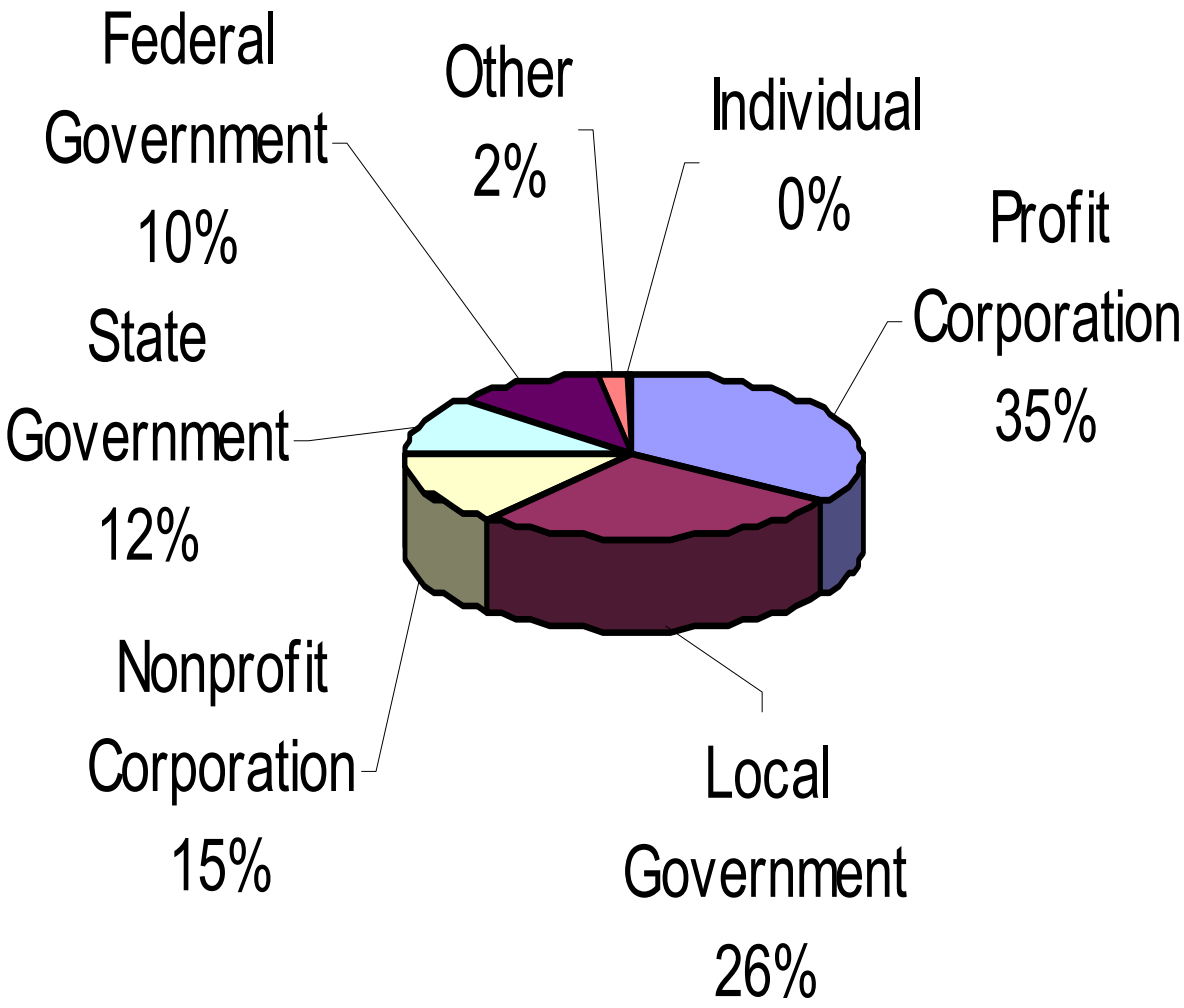
*As of 12.16.02

- **Registered Projects by Building Type***



*As of 12.16.2002

Registered Projects by Owner Type



*As of 12.16.02

LEED™
LEADERSHIP IN ENERGY & ENVIRONMENTAL DESIGN

Making the Business Case for High Performance Green Buildings

Benefits of LEED Certification

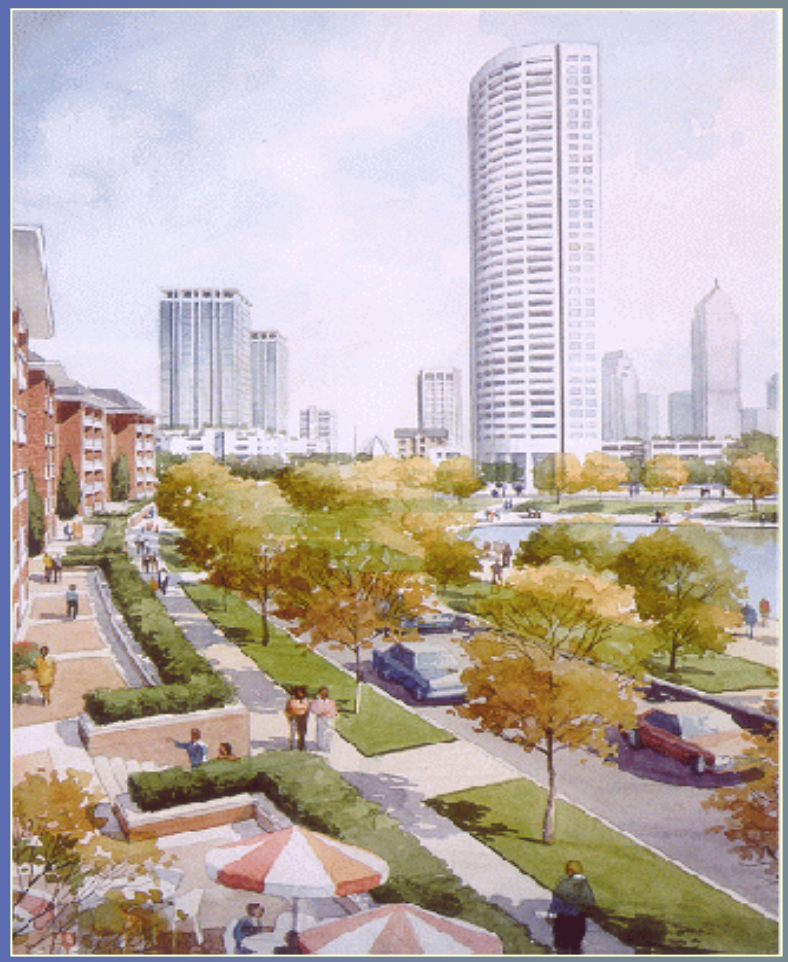
- Recover Higher First Costs — if any
- Design for Cost-effectiveness

Benefits of LEED Certification

- Boost Employee Productivity
- Enhance Health and Well-Being
- Reduce Liability

Benefits of LEED Certification

- Create Value for Tenants
- Increase Property Value
- Take Advantage of Incentive Programs
- Benefit Your Community
- Achieve More Predictable Results



Green Building Rating System

- LEED-NC for New Construction
- LEED-CI for Commercial Interiors
- LEED-H for Homes*
- LEED-EB for Existing Buildings
- LEED-CS for Core and Shell*
- LEED-ND for Neighborhood Developments*

* Launch date 2005

Application Guidelines

- Adapt the LEED rating criteria for use in specific market segments
  - Campus
  - Healthcare
  - Laboratories
  - Retail
  - Schools
  - Volume build

Premier Automotive Group North American Headquarters

Irvine, California

Owner:	*Ford Motor Company*
Project Team:	
Architect:	*LPA, Inc.; SWA Group (landscape)*
Engineers:	*Brandow & Johnson (structural); Tsuchiyama & Kaino (mechanical/plumbing); Konsortum 1 (electrical)*
Contractor:	*Koll Construction, L.P.*
Consultant:	*CTG Energetics, Inc. (sustainability, energy and building commissioning)*
Building Statistics:	
Completion Date:	*November 2001*
Cost:	*$60 Million (construction contract only)*
Size:	*253,000 gross square feet*
Footprint:	*74,000 square feet*
Construction Type:	*Commercial/Industrial*
Use Group:	*Office and Design Center*
Lot Size:	*11.5 acres*
Annual Energy Use:	*24,356,010 kBtu/h*
Occupancy:	*700*

LEED Version 2.0 *CERTIFIED*

Sustainable Sites

- Alternative Transportation: *Three bus routes are located within ¼ mile; bicycle racks and showers provided; 30 electric vehicle recharging stations provided.*
- Reduced Heat Islands: *37.5% of all impervious areas are shaded; 16.6% of non-roof impervious areas have a reflectance of 0.3 (light-colored concrete); Energy Star labeled roofing covers 45% of roof; 39% of roof is vegetated.*

Water Efficiency

- Water Efficient Landscaping: *Drought-tolerant plants and a high efficiency drip irrigation system with rain sensors reduces irrigation water use by 67.2%; irrigation system uses reclaimed water.*
- Innovative Wastewater Technologies: *All toilets use reclaimed water, accounting for more than 50% of total sewage conveyance.*
- Water Use Reduction: *low-flow fixtures; two waterless urinals.*

Energy and Atmosphere

- Optimize Energy Performance: *Exceeds ASHRAE 90.1-1999 by 40% using a high efficiency glazing system, high efficiency lighting with T5 lamps, an underfloor air distribution system in office tower, increased chiller efficiency and a variable speed drive on one chiller.*
- Ozone Depletion: *Base building HVAC&R equipment uses R-134a refrigerant, which is chlorine-free and non-ozone depleting.*

Materials and Resources

- Construction Waste Management: *57% of all construction waste was recycled including concrete, asphalt, paper, metal and cardboard.*
- Recycled Content: *35% of the total materials, measured by LEEDs weighted cost value formula, contain post-consumer and/or post-industrial recycled content.*
- Local/Regional Materials: *32% of total materials, measured by USGBCs weighted cost value, are manufactured within 500 miles – including concrete, landscape materials, reinforcing steel, gypsum and stud assemblies; of those materials, 57% were harvested, extracted or recovered within the 500 mile radius.*

Indoor Environmental Quality

- Construction IAQ Management Plan: *All ducts and permeable materials were protected against contamination during construction; all construction filtration media was replaced before occupancy.*
- Low-Emitting Materials: *Carpets meet CRI Green Label standards.*
- Thermal Comfort: *Complies with ASHRAE Standard 55-1992, Addenda 1995.*
- Daylight & Views: *More than 95% of occupants have views from at least 90% of their work areas.*

Innovation & Design Process

- *Vertical landscaping increases vegetation, provides oxygen, and screens parking garage from view; reclaimed water is used for 100% of wastewater conveyance.*

New York State Department of Environmental Conservation Office Complex at 625 Broadway Avenue

Albany, New York

Owner:	Picotte Companies	
Project Team:	Architect:	*Woodward Connor Gillies and Seleman Architects*
	Engineer:	*Quantum Engineering*
	Contractor:	*Beltrone Construction*

Building Statistics:

Completion Date:	*September 2001*
Cost:	*N/A*
Size:	*471,000 gross square feet*
Footprint:	*45,600 square feet*
Construction Type:	*Commercial*
Use Group:	*Office*
Lot Size:	*2.18 acres*
Annual Energy Use:	*22,232,209 kBtu/year*
Occupancy:	*1700 Staff*

LEED Version 2.0 *Silver*

Sustainable Sites

- Urban Redevelopment: *Urban infill site was previously a gravel parking lot.*
- Alternative Transportation: *Located 80 yards from 4 bus lines; bicycle racks and showers; 15 electric vehicle charging stations; priority carpool parking.*
- Reduced Heat Islands: *Stacked parking; light colored concrete used on 99% of non-roof impervious surfaces; 68% of parking surfaces shaded; Energy Star labeled roof.*

Water Efficiency

- Water Efficient Landscaping: *Native plants require no irrigation.*

Energy and Atmosphere

- Optimize Energy Performance: *Exceeds ASHRAE/IESNA 90.1-1999 by 23.7%.*
- Additional Commissioning: *Verified that the building is designed, constructed and calibrated to operate as intended.*

Materials and Resources

- Construction Waste Management: *51% of construction waste was recycled.*
- Recycled Content: *93% of materials, measured by LEED's weighted cost value formula, contain recycled content (e.g., steel, carpet, cobble pavers).*
- Local/Regional Materials: *56% of materials were manufactured locally (e.g., concrete, bricks, certified wood and metal studs).*

Indoor Environmental Quality

- CO_2 Monitoring: *CO_2 monitoring system has 83 sensors integrated with the building's building management system.*
- Construction IAQ Management Plan: *Included measures to protect HVAC systems, control contaminant sources, interrupt pathways, provide quality housekeeping, and replace HVAC filtration media immediately prior to occupancy.*
- Low-Emitting Materials: *All adhesives, sealants, paints, coatings, carpeting, composite wood emit low or no volatile organic compounds.*
- Daylight & Views: *97% of occupied spaces have a direct line of sight to exterior views.*

Innovation & Design Process

- *Exemplary on-site occupant recycling program that incorporates an educational guidebook, reuse of office supplies, and a composting program. Integrated pest management program for interior and exterior minimizes use of pesticides. Exemplary use of recycled content products.*

Jean Vollum
Natural Capital Center
Portland, Oregon

LEED Version 2.0 *GOLD*

Sustainable Sites
- Site Selection: *Reused a warehouse built in 1895.*
- Urban Redevelopment: *Part of revitalization effort in Portland's historic Pearl District.*
- Alternative Transportation: *Portland streetcar and seven bus stops within ¼ mile of building; bicycle parking available for 47% of building occupants, showers for 27% and lockers for 60%; two alternative fuel car-sharing vehicles located on site with corresponding refueling stations.*
- Stormwater Management: *Impervious area of the site reduced by 26% by adding planters, landscaping islands, porous pavement, vegetative swales and a roof garden; infiltration swale recharges groundwater while removing 100% TSS and 100% TP.*
- Reduced Heat Islands: *Fast growing native trees provide shading of impervious surfaces; light colored paving.*

Water Efficiency
- Water Efficient Landscaping: *Native plantings adapted to local conditions; no irrigation required after one year.*
- Water Use Reduction: *33% reduction.*

Energy and Atmosphere
- Optimize Energy Performance: *Exceeds ASHRAE 90.1-1999 by 21.4% using a VAV system for common areas only, wider indoor temperature range for summer/winter, operable windows with HVAC overrides, daylighting and additional roof insulation.*

Materials and Resources
- Building Reuse: *Over 75% of exterior structure and shell and interior non-shell elements of original building retained; deconstructed materials reused in rehabilitation of building; reused all flooring.*
- Construction Waste Management: *98% of constructed materials recycled/salvaged.*
- Resource Reuse: *Salvaged materials comprised 10% of total. Included stone, brick, lumber, paneling, moldings, heavy timbers and doors.*
- Recycled Content: *Over 50% of materials, as calculated by USGBC's weighted cost value, contain recycled content. Includes concrete mixed with fly-ash, steel (90-96% recycled content), insulation, resilient flooring, carpeting and interior paint (100% recycled latex).*
- Local/Regional Materials: *34% of materials were manufactured locally, including salvaged materials, lumber, concrete, structural steel and doors.*
- Certified Sustainably Harvested Wood: *66% of new wood was from forests certified by the Forest Stewardship Council, including nominal lumber, plywood, decking and windows.*

Indoor Environmental Quality
- Construction IAQ Management Plan: *HVAC system protected during construction and flushed-out after construction, before occupancy.*
- Indoor Chemical & Pollutant Source Control: *Natural fiber mats provided at all entrances; janitors closets independently ventilated and isolated with deck to deck walls.*
- Daylight & Views: *Daylighting reaches more than 75% of occupied spaces; more than 90% of spaces have access to outside views.*

Owner:	Ecotrust
Project Manager:	*PGE Green Building Services* *Ralph DiNola* *(503) 603-1661*
Building Statistics:	
Completion Date:	*September 2001*
Cost:	*$143/square foot*
Size:	*70,000 gross square feet*
Footprint:	*20,000 square feet*
Construction Type:	*Commercial*
Use Group:	*Retail*
Lot Size:	*0.92 acres*
Annual Energy Use:	*kBtu/sf/year*
Occupancy:	*120 Staff*

PNC Firstside Center

Pittsburgh, Pennsylvania

LEED Version 2.0 *SILVER*

Photographer: Ed Massery

Owner: PNC Financial Services Group

Project Team:

Architect:	*L.D. Astorino Companies*
Engineer:	*L.D. Astorino Companies*
Contractor:	*Dick Corporation*
Consultant:	*Paladino Green Building Strategies*

Building Statistics:

Completion Date:	*November 2000*
Cost:	*$108 million*
Size:	*647,000 gross square feet*
Footprint:	*140,418 square feet*
Construction Type:	*5 floor, new construction*
Use Group:	*Financial services*
Lot Size:	*4.66 acres*
Annual Energy Use:	*59 kBtu/sf/year*
Occupancy:	*1800 staff*

Sustainable Sites

- Site Selection: *Remediated brownfield site (previous urban railyard); contributes to an area needing economic revitalization*
- Alternative Transportation: *Ample bus lines; shower facilities for bicycle commuters; electric vehicle recharging station; site acts as downtown link for an extensive bike trail*
- Reduced Site Disturbance: *Exceeded local open space requirements by more than 25% by tightening program needs and stacking floor plans*
- Stormwater Management: *Filtering settlement basins capture and remove 80% of suspended solids and 40% of phosphorous*
- Reduced Heat Islands: *Used light colored/high-albedo materials for at least 36% of the site's non-roof impervious surfaces*

Water Efficiency

- Water Efficient Landscaping: *Sub-surface irrigation system reduces water use for irrigation by more than 50%*

Energy and Atmosphere

- Optimize Energy Performance: *Exceeds ASHRAE 90.1-1999 by 33% using exterior passive sun shading, interior motorized window coverings, underfloor ventilation systems, and air handling units with full economizer capabilities*
- Additional Commissioning: *Best practice commissioning applied*

Materials and Resources

- Recycled Content: *90% post-consumer recycled steel*
- Local/Regional Materials: *54% of materials (by cost) were manufactured within 500 miles; 11% of materials were extracted, recovered or harvested locally*

Indoor Environmental Quality

- CO_2 Monitoring: *CO_2 sensors located in the return air duct*
- Increase Ventilation Effectiveness: *Complies with ASHRAE Fundamentals Chapter 31 through use of diffusers in both the underfloor and overhead air distribution systems and full capacity economizers*
- Construction IAQ Management Plan: *Cleaned the underfloor plenum and conducted a two-week building flush out after construction and before occupancy*
- Low-Emitting Materials: *Carpeting has low VOC emissions*
- Thermal Comfort: *Meets ASHRAE 55-1992 through integrated temperature controls, independent humidifying systems and economizers*
- Daylight & Views: *93% of occupied space has access to exterior views; 79% of occupied space is daylit; strategies included a large southern exposure, skylights, atrium, glazed partitions and doors, and clerestory windows*

Innovation & Design Process

- Innovation in Design: *Carpet tile with releasable adhesives and hybrid HVAC system reduce churn costs and waste*

CHP & LEED

- Credits are attained through total energy savings at the building level – there is no way to achieve credits for source energy savings through CHP strategies

Optimizing Energy

- Energy savings are measured against a baseline model using the energy code as the minimum

CHP & LEED Issues

- Appropriate valuation of energy savings at the source versus at the building
- Determining a CHP baseline that can be used for verification
- Working within existing LEED framework

CHP LEED Committee

- Jan Berry, ORNL
- Keith Kline, ORNL
- Mike MacDonald, ORNL
- Jack Kattner, FVB Energy
- Terri Roberts, U.S. DOE
- Luis Troche, U.S. EPA
- Christian Fellner, U.S. EPA
- John Kelly, Gas Technology Institute
- Jules Paulk, Southface

Pilot Project: Atlantic Station

CHP Committee

- Proposed an immediate credit for Labs and Campus Guidelines
- Repositioned under New Products Committee – influencing the future of the LEED rating systems